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ARMY AVIATION TEST BOARD FORT RUCKER ALA
PRODUCT IMPROVEMENT TEST OF THE FOREIGN OBJECT SCREEN FOR PARTI--ETC(U)
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DEPARTMENT OF THE ARMY
UNITED STATES ARMY AVIATION TEST BOARD
FORT RUCKER, ALABAMA 36360

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JUN 25 1969

SUBJECT: Final Report of Product Improvement Test of the Foreign
Object Screen for Particle Separators on UH-1() and
AH-1G Helicopters, USATECOM Project No. 4-6-0105-02

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1. REFERENCES

a. Letter, AMSAV-EOT, Headquarters, US Army Aviation Materiel Command, 20 May 1968, subject: "Request for Test," with 1st Indorsement, AMSTE-BG, Headquarters, US Army Test and Evaluation Command, 18 June 1968.

b. Interim Report of Product-Improvement Test of Inlet Screen for UH-1() and AH-1G Particle Separator, US Army Aviation Test Board, 27 November 1968.

16 USATECOM-4-6-0105-02

2. BACKGROUND

UH-1() and AH-1G Helicopters have a particle separator installed that is designed to remove small particles from the engine inlet air. It does not remove, or protect against foreign object damage (FOD) caused by, larger objects such as nuts, bolts, Dzus fasteners, lockwire, etc. Because of the high rate of FOD to engines, the engine manufacturer developed an inlet screen for the separator. At the request of the US Army Aviation Systems Command (USAAVSCOM), the US Army Test and Evaluation Command, on 18 June 1968, directed the US Army Aviation Test Board (USAAVNTBD) to conduct a product-improvement test of the inlet screen (ref 1a). On 27 November 1968, an interim report was submitted to USAAVSCOM (ref 1b).

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AH-1G Helicopters, USATECOM Project No. 4-6-0105-02

3. OBJECTIVE

To determine suitability of the test inlet screen to prevent foreign objects from being ingested by T53 engines installed on UH-1()/AH-1G Helicopters.

4. SCOPE AND METHOD

The USAAVNTBD conducted this product-improvement test at Fort Rucker, Alabama, and vicinity during the period June 1968 to June 1969. Both prototype and production (FSN 1560-167-8113) Foreign Object Screens were provided by USAAVSCOM and installed on UH-1B, UH-1H, UH-1M, and AH-1G Helicopters. These aircraft were flown on profiles established for the T53-L-13 product-improvement test (USATECOM Project No. 4-6-0150-05). Adequacy of the installation procedures was determined and man-hour requirements were recorded. The screens were inspected daily for damage. The engine compressors were visually inspected, as required by the other test.

5. SUMMARY OF RESULTS

a. Test hours accomplished on the inlet screens were:

<u>Helicopter</u>	<u>Serial No.</u>	<u>Hours</u>	<u>Reason for Removal</u>
UH-1B ¹	63-8659	346.5	Still in service.
UH-1H ²	66-1093	1,458.5	Still in service.
UH-1H ¹	66-1094	556.4	Bottom right-hand forward corner of screen was torn. Equipment Performance Report KF-1 was submitted.
UH-1H ²	66-1094	995.5	Still in service.

¹ Prototype model inlet screens.

² Production model inlet screens.

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<u>Helicopter</u>	<u>Serial No.</u>	<u>Hours</u>	<u>Reason for Removal</u>
UH-1M ¹	65-9445	1,175.4	Still in service.
AH-1G ¹	66-15355	982.3	The metal frame on which the trunk latch was mounted had bent, resulting in the trunk-type fasteners' not securing the screen tightly together. Equipment Performance Report KF-2 was submitted.
AH-1G ¹	66-15355	164.3	Still in service.

b. The production model screens operated a total of 2,454.0 hours without any damage. The prototype model screens operated a total of 3,184.6 hours with two problems as indicated in paragraph 5a.

c. Installation procedures furnished with each screen kit were adequate. However, instructions should denote that special care must be taken to assure that the screen is properly secured around the particle separator before closing the trunk type fasteners. Screens required an average of 30 man-minutes for installation. No special tools were required for installation and the time and effort required for installation did not vary between helicopter types.

6. DISCUSSION

The most significant result of this test is that there was no evidence of major FOD to any engine with the inlet screen installed during the entire 5,638.6 flying hours. Prior to utilization of the test screens, FOD had been a major problem on test engines at USAVNTBD despite a concentrated FOD prevention program.

¹Prototype model inlet screens.

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7. CONCLUSION

The test inlet screen is suitable and desirable for installation on
UH-1()/AH-1G Helicopters to prevent foreign objects from being
ingested by T53 engines.

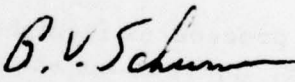
8. RECOMMENDATIONS

a. All UH-1()/AH-1G Helicopters be retrofitted with the production
model Foreign Object Screen, Federal Stock Number 1560-167-8113.

b. Service use of production model screens be monitored to deter-
mine whether the frame bending problem reported in paragraph 5a
recurs to the extent that product improvement is required.

FOR THE PRESIDENT:

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13. ABSTRACT			
<p>The US Army Aviation Test Board tested the Foreign Object Screen for Particle Separators to determine its suitability to prevent foreign objects from being ingested by T53 engines installed on UH-1()/AH-1G Helicopters. From June 1968 to June 1969 at Fort Rucker, Alabama, five prototype and two production model screens were tested for totals of 3,184 and 2,454 hours, respectively. Two problems--a torn screen and a bent frame--were experienced on the prototype screens; no problems occurred with the production screens. There was no evidence of major foreign object damage to any engine with the inlet screen installed during the entire 5,638 test hours. It was concluded that the test inlet screen is suitable and desirable for installation on UH-1()/AH-1G Helicopters to prevent foreign objects from being ingested by T53 engines. It was recommended that T53 engines installed on all UH-1()/AH-1G Helicopters be retrofitted with the production model Foreign Object Screen (FSN 1560-167-8113) and that service use of production model screens be monitored to determine whether the frame bending problem recurs to the extent that product improvement is required.</p>			

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